

# Hamstring electromyographic activation according to 30 rehabilitation knee exercises

M. Dauty <sup>a,\*</sup>, P. Menu <sup>b</sup>, J.L. Borel <sup>b</sup>, C. Dubois <sup>b</sup>

<sup>a</sup> *MPR locomoteur, CHU de Nantes, hôpital Saint-Jacques, 85, rue Saint-Jacques, 44035 Nantes cedex 01, France*

<sup>b</sup> *CHU de Nantes, Nantes, France*

\*Corresponding author.

**Keywords:** Hamstring; Rehabilitation; Electromyography; Knee

**Objective.**— To quantify the hamstring activation according to various rehabilitation exercises used to control the knee.

**Method.**— Fifteen healthy subjects, 22.8 ± 3 years old, were evaluated on the thigh to quantify the electrical activity of hamstring muscles and the quadriceps when performing 30 rehabilitation exercises. Various functional exercises of walking, standing, sitting position, and analytic hamstring exercises according to isometric and eccentric contractions were studied.

**Results.**— After signal processing, results were expressed according to the area by second (μvolt/s) of the RMS (Root-Mean-Square) to organize an exercise hierarchy according to the intensity of hamstring activation. The exercises performed in the sitting position and the functional exercises weakly activated hamstring muscles in contrast with the eccentric and isometric analytical exercises.

**Discussion.**— The functional exercises studied can be proposed very early to control the knee. However, they are by consequence weakly effective to restore hamstring muscular strength. Analytical exercises should be integrated into the program of rehabilitation but later if these must be performed after knee trauma or knee surgery.

**Further reading**

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doi:10.1016/j.rehab.2011.07.723

CO11-007–EN

# Muscular strength recovery after revision knee ligamentoplasty

M. Dauty <sup>a,\*</sup>, P. Menu <sup>b</sup>, B. Rousseau <sup>b</sup>, C. Dubois <sup>b</sup>

<sup>a</sup> *MPR locomoteur, CHU de Nantes, hôpital Saint-Jacques, 85, rue Saint-Jacques, 44035 Nantes cedex 01, France*

<sup>b</sup> *CHU de Nantes, Nantes, France*

\*Corresponding author.

**Keywords:** Isokinetic; Anterior Cruciate Ligament; Revision

**Objective.**— To measure the knee isokinetic strength recovery after a revision of an anterior cruciate ligament reconstruction.

**Method.**— Thirty-nine revisions (23 by hamstring procedure [STG], 10 by ipsilateral patellar tendon procedure [iPT] and 6 by contralateral patellar tendon procedure [cPT] were compared with 78 primary plasties [46 STG and 32 PT procedures]). The recovery of the muscular strength was measured at 4, 6 and 12 months post-surgery.

**Results.**— The strength deficit at 12 months post-surgery after revision was comparable with that of a primary ligamentoplasty performed according to the same procedure. On the other hand, at 4 and 6 months post-surgery, the extensors deficit was lesser after the hamstring procedure revision (25% ± 16 vs 37% ± 16; *P* < 0.001) and after the iPT procedure revision (41% ± 11 vs 17% ± 17; *P* < 0.001).

**Discussion.**— Our results at 12 months post-surgery are comparable with those observed during cohort cross sectional studies with a long follow-up. The weak extensors deficit after the STG procedure can be explained by a program of rehabilitation which was less intense because of lesser challenge to recover sports activity. For the cPT procedure, the weak extensors deficit is explained by a knee graft deficit which persists at least until 6 months post-surgery.

evaluated after the primary ligamentoplasties using the same surgical procedure.

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doi:10.1016/j.rehab.2011.07.724

CO11-008–EN

# Support resumption by table tennis practice after knee ligamentoplastie

M. Dauty <sup>a,\*</sup>, P. Menu <sup>b</sup>, C. Dubois <sup>b</sup>

<sup>a</sup> *MPR locomoteur, CHU de Nantes, hôpital Saint-Jacques, 85, rue Saint-Jacques, 44035 Nantes cedex 01, France*

<sup>b</sup> *CHU de Nantes, Nantes, France*

\*Corresponding author.

**Keywords:** Proprioception; Knee; Ligamentoplastie; Rehabilitation; Sport

**Objective.**— To quantify the support on the operated lower limb with a force platform during the practice of table tennis and to study the effect of this physical activity on premature restoration of support after knee ligamentoplasty.

**Subjects.**— The movements of the centre of pressure (average position [x, y], lengths and surface) of 40 subjects operated at the level of the knee were measured when playing table tennis. A comparison with a control group of 20 non-operated subjects was studied to quantify the support. Then, operated subjects were randomized according to practice or not of controlled table tennis training (10 sessions of 15 minutes for 5 days) to determine whether this physical activity was interesting to restore the support of the operated lower limb.

**Results.**— Operated subjects for the knee presented a defect of support of the operated side compared with non-operated subjects during table tennis practice. Training by table tennis practice improved significantly the lateral and the total movements of the centre of pressure of operated subjects even though the values of non-operated subjects had not been achieved.

**Discussion.**— Reconstruction of the knee anterior cruciate ligament leads to a defect of support which a force platform coupled with the standardized table tennis practice is capable of quantifying. Tennis tables training for one week improves the support of the operated lower limb and the lateral and total mobility of the subject. This physical activity can be associated with the accelerated rehabilitation program proposed after ligamentoplasty.

**Further reading**

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doi:10.1016/j.rehab.2011.07.725

CO11-009–EN

# Kinematics during a sidestep manoeuvre in handball: Study of the influence of gender

E. Falcoz <sup>a,\*</sup>, C. Guegan <sup>b</sup>, M. Lempereur <sup>c</sup>, O. Rémy-Néris <sup>d</sup>

<sup>a</sup> *Service de médecine physique et réadaptation, CHRU de Brest, 2, avenue Foch, 29609 Brest cedex, France*

<sup>b</sup> *Centre de médecine du sport de la ville de Brest, Brest, France*

<sup>c</sup> *Laboratoire du mouvement, CHRU de Brest, Brest, France*

<sup>d</sup> *Service de médecine physique et réadaptation, CHRU de Brest, Brest, France*

\*Corresponding author.

**Keywords:** Anterior cruciate ligament; Biomechanics; Direction change; Sport; Handball; Gender

**Introduction.**— Anterior cruciate ligament (ACL) tear is a common injury in handball with a risk 3–5 times higher among women [1]. The sidestep manoeuvre